28 December 1979

STATINTL

MEMORANDUM FOR THE RECORD

SUBJECT: Bus Communications Requirements Document

REFERENCE: ODP-9-1718, dated 18 December 1979

Per discussion between ███████████████████ STATINTL
ODP, paragraph 2, sentence 2 is removed from referent
document (attached). Further, the document will be used by
OC as the focal tasking document from ODP for bus require-
ments in the preparation of the 1982 program plan.

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Attachment:
 As stated

APPROVED:

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_____   2 8 DEC 1979
                                                        Date

Director of Data Processing   1/3/80
                                                        Date

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ODP-9-1718
18 December 1979

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MEMORANDUM FOR: ▮▮▮▮▮▮▮
Chief, Engineering Division, OC

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FROM : ▮▮▮▮▮▮▮
Chief, Engineering Division, ODP

SUBJECT : ODP BUS Requirements

1. This memorandum will present the BUS requirements in three sections. Section I will describe functional requirements that must be included in the BUS system. Section II will describe four major types of terminals that are expected to be supported on the BUS system. Section III will present our best estimate of the number of each type of terminal described in Section II that could be on the BUS between 1980 and 1990.

2. This set of requirements is intended to support the design of the BUS system so that it can accommodate the non-SAFE ODP requirements. ~~These requirements are not intended to support any procurement actions or detail design activites.~~ It is my intent that once an agreement is reached on an overall BUS design, Engineering Division will provide you additional detailed information as required.

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Section I - Functional Requirements

1. Terminal to Host Connection

From any terminal it must be possible for the user to easily connect to any host computer on the BUS, to which the user and terminal have authorized access. Terminals include RJE stations.

It also must be possible to establish a default connection for a particular terminal to a particular host.

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2.   Printer to Host Connection

It must be possible to assign a printer to any particular host. The option must be available for an authorized user/operator to temporarily connect a local printer to a different host computer.

3.   Host to Host Connection

It must be possible for a host computer on the BUS to connect to another host on the BUS for file transfers. Typically one of the host computers would be a general purpose mini-computer host in a customer area or a special purpose mini-computer. Today this function is accomplished using a bisync connection to the JES3 system.

It must also be possible for a host computer to connect to a different host as if it were an interactive terminal at the same time it is supporting users at terminals. An example of this type of connection would be where a mini-computer normally supports a user with an application in the mini-computer, but occasionally the user needs access to another host.

The data rate for file transfer should be from 19.2KB to 56KB or higher if possible. The data rate for terminals should be up to 19.2KB.

4.   Out Building Support

The BUS system design should provide for the installation of a BUS in major Agency out buildings (from 4 to 8) to service all terminals in the building. The users of the BUS in such a building should have the same capability as in Headquarters, except that there may be a limitation on data transfer rate between the two buildings.

5.   Usage Statistics

The BUS system must provide accounting on the utilization of each terminal on the BUS to each host similar to the existing Comten Accounting Information system.

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6.   Security

The BUS system must enforce security rules that would prevent certain connections between terminals and host computers or host to host connections.

7.   Host Computers

Large IBM Hosts

The BUS will be connected to thirteen IBM type host computers in 1984 and sixteen IBM type computers by 1990. The number of active terminals on the IBM type hosts would vary from 100 to 600 for a single host.

Mini-Computer Hosts

The BUS will be connected to 25 to 50 mini-computer hosts by 1986. Each mini-computer would support from 4 to 64 active terminals. It would also require from 1 to 8 concurrent connections to other hosts for file transfer. In some cases the mini-computer will also appear to a large IBM host as from 1 to 16 interactive terminals.

Section II - Major Terminal Types

1.   Standard CRT Terminal

a.   Data Rate

19.2KB normal speed, option for 9600, 4800 and 2400 baud speeds.

b.   Block Size

Variable up to 256 bytes.

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c. Protocol

Block type of protocol that provides flow control and re-transmission. SDLC for level 1 and 2 is one possibility.

Clustering and Multi-Drop

The BUS system must support clustering of terminals in a single area from one controller where each terminal may be connected to a different host on the BUS. Also, the design must support a multi-drop line with several terminals, each of which could be connected to a different host.

d. Utilization Profile

Low average utilization of the BUS would be expected. CRT terminals typically have less than 5% utilization on input to the host and 10% utilization on output from the host.

e. Source

These terminals will generally be procured in large numbers according to Agency specifications. The new Agency standard Delta Data 7260T is a good example. However, where possible, accepted industry standards should be used at the interfaces between the terminal and the BUS.

2. Printers

a. Data Rate

Maximum speed would be 19.2KB optional speeds 9600, 4800, 2400, 1200, 600 and 300 baud.

b. Block Size

2K to 4K.

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c. Protocol

IBM 3780 protocol and its replacement. Lower speed would be async, with support of X-on, X-off for flow control.

d. Utilization Profile

Constant usage would be expected during peak periods. Number of hours per week would vary from 2 to 40, during prime shift.

e. Source

The existing inventory of Hetra 3780 printers, existing Design 100 low speed printers, IBM 6670 or similar type of device, Sanders Technology Media 12/7 writer, TI Silent 700 or similar type of device are the principal printers. In all cases, standard commercial printers would be bought so that the interface should be an industry standard, and should require minimum or no modifications, except for TEMPEST, to the printer and its software.

3. Word Processing Devices

a. Data Rate

Normal speed would be 19.2KB with optional speeds of 9600, 4800, 2400, and 1200 baud.

b. Block Size

256 to 4K with most less than 1K.

c. Protocol

IBM 3780 and async TTY or other industry standard protocols.

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d. Utilization Profile

Low average utilization of the BUS would be
expected. A user would typically want to connect
to a system to route a data file to some source
or receive a data file from a host CPU. The BUS
must provide the capability to establish a contin-
uous connection to a host computer so the computer
could send a data file to the word processor when
it was available. This includes the use of a
printer on the BUS as an output device for the
word processor system.

e. Source

In general, these systems will be commercial
systems that are bought for a particular Agency
group. While there will be efforts to standarize,
it is reasonable to assume that there will still
be a variety of word processing systems installed
in the Agency. Standalone systems and clustered
systems are both expected in large numbers.

4. Special Purpose Terminals

a. Data Rate

56KB to 2400 baud.

b. Block Size

256 to 4K.

c. Protocol

Any of the common industry standard.

d. Utilization Profile

Similar to the standard CRT terminals.

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    e.   Source

       Today the Tektronix and Ramtek are two examples of special purpose terminals connected to ODP systems. Graphic terminals will continue to be special purpose terminals that will be selected based on a specific customer requirement. These terminals must be installed in both Headquarters and out buildings.

Section III

    Is shown as Attachments 1 thru 4.

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